

PATENT COOPERATION TREATY

Rec'd PTO

06 JUL 2005

From the
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

PCT

WRITTEN OPINION
(PCT Rule 66)

To:

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Date of mailing
(day/month/year) 28.12.2004

Applicant's or agent's file reference
42370-0002

REPLY DUE **within 2 month(s)**
from the above date of mailing

International application No.
PCT/CA 03/02031

International filing date (day/month/year)
30.12.2003

Priority date (day/month/year)
09.01.2003

International Patent Classification (IPC) or both national classification and IPC
F01C1/20

Applicant
CONNERS, James M.

1. This written opinion is the **first** drawn up by this International Preliminary Examining Authority.
2. This opinion contains indications relating to the following items:
 - I ☒ Basis of the opinion
 - II ☐ Priority
 - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV ☐ Lack of unity of invention
 - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI ☐ Certain documents cited
 - VII ☐ Certain defects in the international application
 - VIII ☐ Certain observations on the international application
3. The applicant is hereby **invited to reply** to this opinion.

When? See the time limit indicated above. The applicant may, before the expiration of that time limit, request this Authority to grant an extension, see Rule 66.2(d).

How? By submitting a written reply, accompanied, where appropriate, by amendments, according to Rule 66.3. For the form and the language of the amendments, see Rules 66.8 and 66.9.

Also: For an additional opportunity to submit amendments, see Rule 66.4.
For the examiner's obligation to consider amendments and/or arguments, see Rule 66.4 bis.
For an informal communication with the examiner, see Rule 66.6.

If no reply is filed, the international preliminary examination report will be established on the basis of this opinion.
4. The final date by which the international preliminary examination report must be established according to Rule 69.2 is: 09.05.2005

Name and mailing address of the international preliminary examining authority:



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100/541482

WRITTEN OPINION

JC20 Rec'd PCT/PTO v 6 JUL 2005
International application No. PCT/CA 03/02031

I. Basis of the opinion

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this opinion as "originally filed"*):

Description, Pages

1-25 filed with the demand

Claims, Numbers

1-20 as amended (together with any statement) under Art. 19 PCT

Drawings, Sheets

1/22-22/22 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
☐ the language of publication of the international application (under Rule 48.3(b)).
☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- ☐ contained in the international application in written form.
☐ filed together with the international application in computer readable form.
☐ furnished subsequently to this Authority in written form.
☐ furnished subsequently to this Authority in computer readable form.
☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- ☐ the description, pages:
☐ the claims, Nos.:
☐ the drawings, sheets:

5. ☐ This opinion has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

6. Additional observations, if necessary:

V. Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**1. Statement**

| | | |
|-------------------------------|--------|------|
| Novelty (N) | Claims | 1-20 |
| Inventive step (IS) | Claims | 1-20 |
| Industrial applicability (IA) | Claims | 1-20 |

2. Citations and explanations**see separate sheet**

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

Reference is made to the following documents:

D1: DE 2550360 A

D2: AT 311178 B

1. Preliminary remarks

The application lacks clarity (Art 6 PCT) for the following reasons:

- a. the expression "power transfer means" used in claim 1 is vague and unclear as it does not imply a well-recognized set of technical features;
- b. the expressions "expanding substantially adiabatically", "the combustor means is adapted to receive varying amount ... of power in use" and "the compressor is adapted ...to the load being driven by the power" used in claims 1 and 11 are vague and unclear as they attempt to define the subject-matter in terms of the result to be achieved, which merely amounts to a statement of the underlying problem, without providing the technical features necessary for achieving this result. Hence these statements do not add any clear technical features to the subject-matter of the claims and as such they don't limit their scope;
- c. the expression "a reservoir" used in claims 7-9 is vague as it is not clear what the technical features of this reservoir are compared to a normal connection pipe or radiator piping (see for example claims 7 and 8) or even to a pressure tank (see claim 11);
- d. although the generic expressions "a compressor"; "a positive displacement air motor" and "a positive displacement gas expander" are used in claims 1 and 11, it is clear in the light of the description (page 2, lines 23-25; page 3, lines 5-7) that it is the applicant's intention to use the type of machine described rather than any other type. Because of this and of the lack of clear support from the description about other specific types of machines than these in the various illustrated embodiments (fig 1-22), these expressions of claims 1 and 11 should be restricted to the particular type of machines described in claim 14 of the present application;

- e. it is not clear (claim 1) how a radiator that cools the compressed air discharged by a compressor can reduce the work required by the compressor to compress this air;
- f. the expression "internal combustion engine" (claim 11) is contradictory to the expression "tubular combustor" as, by definition, the characteristic feature of an internal combustion engine is that the combustion chamber is predominantly formed by the working chamber(s) inside the engine and as, from the description and figures (for example fig 1), it is clear that the tubular combustor is a combustion chamber external to the engine.

2. Independent claim 1

Taking into account the lack of clarity mentioned here above, the present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of independent claim 1 is not new in the sense of Article 33(2) PCT. The reasons therefore are the following:

D1 discloses (the references in parentheses applying to this document) (fig 30 and page 20, lines 12-31) an engine with a compressor (4); with a radiator (6a and corresponding portions of the piping connecting the compressor and the engine); with combustor means (5,6); with two positive displacement motors (7) in series; with power transfer means (9).

Hence the subject-matter of claim 1 is not new (Art 33(2) PCT). The subject-matter of claim 1 is industrially applicable (Art 33(4) PCT).

3. Dependent claims 2-10 and 12-13

Dependent claims 2-10 and 12-13 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of Art 33 PCT in respect of novelty and/or inventive step as the combination of features that they contain is already disclosed in the prior art documents (see cited documents and corresponding passages in the search report) taken alone or in combination or are merely a combination of obvious and well-known features (see for example claims 8 or 10). The subject-matter of claims 2-10 and 12-13 is industrially applicable (Art 33(4) PCT).

4. Independent claim 11

The combination of the features of independent claim 11, with the necessary clarifications (see point 1), is neither known from, nor rendered obvious by, the available prior art and therefore the subject-matter of claim 11 meets the requirements of Art 33 PCT in respect of novelty and inventive step. The subject-matter of claim 11 is industrially applicable (Art 33(4) PCT).

5. Independent claim 14

The subject-matter of claim 14 is not new (Art 33(2) PCT) as D2 discloses (fig 1 and 2; page 3, lines 5-20) a machine with housing means (1); with a multilobe piston (5) and with a pair of gate rotors (6,7) dividing the piston chamber into multiple subchambers (34-37) in communication with fluid ports (8-11) allowing the use of the machine as a compressor or as an expander (page 2, line 1).

Hence the subject-matter of claim 14 is not new (Art 33(2) PCT). The subject-matter of claim 14 is industrially applicable (Art 33(4) PCT).

6. Dependent claims 15-20

Dependent claims 15-20 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of Art 33 PCT in respect of novelty and/or inventive step as the combination of features that they contain is already disclosed in the prior art documents (see cited documents and corresponding passages in the search report) taken alone or in combination or are merely a combination of obvious and well-known features (see for example claim 20).

Certain defects in and observations on the international application

1. Although claims 1, 11 and 14 have been drafted as separate independent claims, they appear to relate effectively to the same subject-matter. The aforementioned claims therefore lack conciseness and as such do not meet the requirements of Article 6 PCT.
2. Independent claims are not in the two-part form in accordance with Rule 6.3(b) PCT, which in the present case would be appropriate, with those features known

in combination from the prior art being placed in the preamble (Rule 6.3(b)(I) PCT) and with the remaining features being included in the characterising part (Rule 6.3(b)(ii) PCT).

3. The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).
4. Contrary to the requirements of Rule 5.1(a)(ii) PCT, the relevant background art disclosed in the prior art documents is not mentioned in the description, nor are these documents identified therein.